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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/565,897

01/25/2006

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07/22/2009

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EXAMINER

ARCIERO, ADAM A

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

07/22/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/565,897	<b>Applicant(s)</b> HIRAKIMOTO ET AL.	
	<b>Examiner</b> ADAM A. ARCIERO	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 27-33 and 35-52 is/are pending in the application.
- 4a) Of the above claim(s) 39-52 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 27-33 and 35-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

Art Unit: 1795

**IONIC CONDUCTOR, METHOD OF MANUFACTURING THE SAME, AND  
ELECTROCHEMICAL DEVICE**

Examiner: Adam Arciero      S.N. 10/565,897      Art Unit: 1795      July 8, 2009

**DETAILED ACTION**

1.      The Applicant's amendment filed on February 12, 2009 was received. Claims 27-52 are currently pending. Claims 39-52 are withdrawn from consideration. Claim 27 is amended. Claim 34 is cancelled.

2.      The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Claim Objections***

3.      Claim 37 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 37 depends off of canceled claim 34.

***Claim Rejections - 35 USC § 102***

Art Unit: 1795

4. The claim rejections under 35 U.S.C. 102(b) as being anticipated by UETAKE on claims 27-33 are withdrawn because Applicant has amended independent claim 1.

***Claim Rejections - 35 USC § 103***

5. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over UETAKE and ITO et al. on claim 34-38 are withdrawn because Applicant has amended independent claim 1 and canceled claim 34.

6. Claims 27-33 and 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uetake (WO 02/058177), see correspond Uetake (US Patent 7,226,699 for translation) in view of Brown et al. (US 6,485,856 B1).

As to Claims 27-29 and 35-38, Uetake discloses proton conductor (ionic conductor) comprising a proton dissociative group (ion-dissociative group) bonding to a fullerene group (derivative carbonaceous substance) and polyvinyl alcohol, polyvinylidene fluoride and polyfluoroethylene (polymer comprising a basic group) (column 4 lines 60-68, column 5 lines 1-25 and column 10 lines 35-40). The fullerene derivative and the polyvinyl alcohol are dissolved in an organic solvent and printed. The water is vaporized off to formulate a proton conductor film (ion conductor) (column 11 lines 47-60). Uetake does not specifically disclose wherein the polymer of said substance having said basic group is a polymer of a compound containing at least any one of a nitrogen atom, an oxygen atom and a sulfur atom.

However, Brown et al. teaches of an ionic conductor membrane for a fuel cell (Abstract), wherein said membrane comprises a proton conducting polymer having a basic group of a

Art Unit: 1795

compound containing a nitrogen atom (col. 6, lines 60-64). At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the proton conductor of Uetake with a proton conducting polymer comprising a nitrogen atom, such as polybenzimidazole alkyl, because Brown et al. teaches that with the addition of polybenzimidazole alkyl as a filler polymer for the proton conducting membrane, the proton conducting ability of said membrane is enhanced.

As to Claim 30, Uetake discloses a proton dissociative group (ion-dissociative group) is an acidic functional group (column 5 lines 9-15).

As to Claim 31, Uetake discloses the proton dissociative group introduced to the carbon atoms and polyvinyl alcohol in an amount not less than about 20% (col. 10 lines 25-35).

As to Claim 32, Uetake discloses a proton conductor comprising a proton dissociative group  $-\text{SO}_3\text{H}$  (ion-dissociative group) (column 5 lines 9-14). It is well known in the art that hydrogen (H) is a cation producible group.

As to Claim 33, Uetake discloses a proton conductor comprising a functional group –  $\text{OPO}(\text{OH})_2$ . It is well known in the art that hydrogen (H) is a cation producible group.

### ***Response to Arguments***

7. Applicant's arguments, see Remarks, filed February 12, 2009, with respect to the rejection(s) of claim(s) 34 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. A new grounds of rejection has been made.

Art Unit: 1795

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ADAM A. ARCIERO whose telephone number is (571)270-5116. The examiner can normally be reached on Monday to Friday 8am to 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AA

/Dah-Wei D. Yuan/  
Supervisory Patent Examiner, Art Unit 1795